

1.0 INTRODUCTION

This report presents the annual summary of environmental monitoring data collected at the West Valley Demonstration Project (WVDP) from January 1, 1987 through December 31, 1987. The Project was implemented by law as a demonstration of technology and includes sufficient environmental monitoring to help assure public safety with respect to the activities on the site and the waste materials which reside there. The current monitoring program implemented by West Valley Nuclear Services Company (WVNS) provides data in compliance with Department of Energy guidelines and recommendations as well as with applicable federal and New York State laws and regulations.

1.1 Historical Overview

On February 26, 1982, the responsibility for operation and maintenance of the former Nuclear Fuel Services, Inc. (NFS) reactor fuel reprocessing facility at West Valley was transferred to the Department of Energy (DOE). Public Law No. 96-368, enacted in 1980, mandated the demonstration of technology for solidification of the 2.2 million litres (580,000 gallons) of liquid high-level radioactive waste that were produced by commercial fuel reprocessing at the plant. These wastes are now held in underground storage tanks at the facility. The DOE selected West Valley Nuclear Services Company as the contractor to implement the provisions of this law.

When WVNS assumed operational control, the plant was shut down and NFS was conducting an environmental monitoring program appropriate to the maintenance status of the facility as licensed by the NRC. WVNS recognized that the NFS program required substantial change to prepare for high-level waste processing operations currently scheduled to

begin with supernatant treatment in May, 1988, followed by the initiation of vitrification in October, 1992. Accordingly, in 1982 WVNS began to implement a full-scale environmental surveillance program in support of these planned operations and by 1985 had fully implemented this program. As recommended in DOE Order 5484.1, Chapter III, Paragraph 1, this program has provided more than two years of environmental baseline data prior to high-level waste processing.

A comprehensive Environmental Evaluation (EE) was published in June 1984 to initiate the decision-making process for disposal of Project low-level radioactive waste (LLW). The intent of the Project was to phase out the methods used by NFS and replace them with state-of-the-art engineered disposal technology. Based on the review of the EE by the Department of Energy, the Project staff was directed to prepare an Environmental Assessment (EA) which analyzed alternative disposal options more thoroughly than was appropriate in the EE. In April of 1986, the Department of Energy approved the LLW disposal EA, and after an appropriate public comment period, issued a Finding of No Significant Impact (FONSI) in August of the same year.

Environmental Evaluations were also prepared in 1985 and 1986 for the major solidification process support systems, including the High Level Waste Vitrification System, Supernatant Treatment System (STS), Cement Solidification System (CSS), and Liquid Waste Treatment System (LWTS). These documents were approved by Project management and submitted to DOE for review and approval.

Decontamination activities to convert the reprocessing plant for use in the vitrification process have required continued operation of basic services, including low-level radioactive

waste management. Facility operations through 1986 included periodic disposal of plant wastes, low-level solid radioactive waste from decontamination and maintenance activity, in the NRC-licensed disposal area.

1.2 1987 Program Overview

During 1987 the environmental surveillance plan was again updated to reflect the nearing completion of process facilities. The revisions also reflected Project monitoring experiences to date. The updated plan provides for coverage of new on-site effluent points and monitoring of active waste management areas. The revised plan is described in detail in Appendix A which includes a summary of the changes that were made in 1987. As this summary indicates, several more additions and modifications identified in 1987 are planned for implementation in 1988 as facilities become operational.

Throughout 1987 liquid wastes resulting from plant activities were processed at the existing low-level waste treatment facility (LLWTF) prior to discharge.

Construction was completed in 1987 on an above-ground storage facility for Class B and C low-level radioactive wastes. This drum storage cell is located to the southwest of the plant and adjacent to the NRC-licensed disposal area. Covered storage facilities for Class A wastes were also expanded in 1987. The expansion of LLW storage facilities has been necessitated by the conditions of a settlement agreement resulting from a lawsuit brought against the Project by the Coalition on West Valley Nuclear Wastes and the Radioactive Waste Campaign. This settlement is conditioned upon the Project's cessation of LLW waste disposal pending the preparation of an Environmental Impact Statement (EIS). Both operational and environmental monitoring programs have been expanded to accommodate these expanded storage operations.

Approval of several EEs has recently been received from the Department of Energy's Idaho Operations Office. These have included the EEs for the Vitrification Facility, STS, CSS, and LWTS.

1.3 Site Characteristics

The WVDP site is located in a rural setting approximately 50 km (30 mi) south of Buffalo, New York (Figure 1-1), at an average elevation of 400 m (1,300 ft) on New York State's western plateau. The plant facilities used by the Project occupy approximately 63 hectares (156 acres) of chain-link fenced area within a 1,350-hectare (3,300-acre) reservation that constitutes the Western New York Nuclear Service Center (WNYNSC). The communities of West Valley, Riceville, Ashford Hollow, and the village of Springville are located within 8 km (5 mi) of the plant. Several roads and one railway pass through the Center, but no human habitation, hunting, fishing, or public access are permitted on the WNYNSC.

The land immediately adjacent to the WNYNSC is used primarily for agriculture and arboriculture. Cattaraugus Creek to the north serves as a water recreation area (swimming, canoeing, and fishing). Although limited irrigation of adjacent golf course greens and tree farms is taken from Cattaraugus Creek, no public water supply is drawn from the creek downstream of the WNYNSC.

The average annual temperature in the region is 7.2 °C (45.0 °F) with recorded extremes of 37 °C (98.6 °F) and -42 °C (-43.6 °F). Rainfall is relatively high, averaging about 104 cm (41 in.) per year. Precipitation is evenly distributed throughout the year and is markedly influenced by Lake Erie to the west and Lake Ontario to the north. All surface drainage from the WNYNSC is to Buttermilk Creek which flows into Cattaraugus Creek and ultimately into Lake Erie. Regional winds are predominantly from the west and south at over 4 m/s (9 mph) during most of the year.

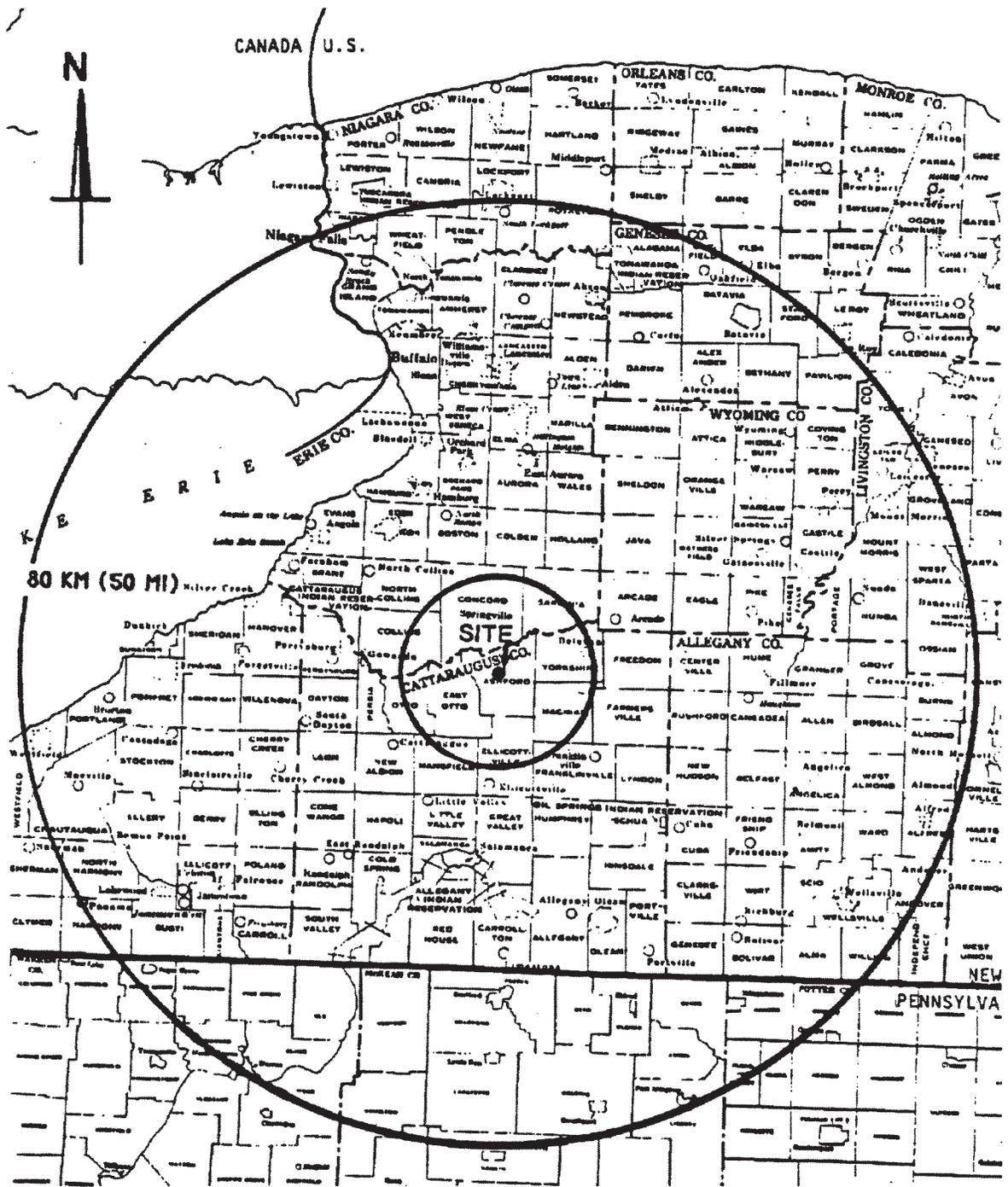


Figure 1-1. Location of the Western New York Nuclear Service Center.

The WNYNSC lies within the northern hardwood forest region, and the diversity of its vegetation is typical of the area. Equally divided between forest and open land, the site provides habitats especially attractive to white-tailed deer and the various birds, reptiles, and small mammals indigenous to the region. No endangered species are known to be present on the reservation.

The geology of the site is characterized by glacial deposits of varying thickness in the valley areas underlain by sedimentary rocks which are exposed in the upper drainage channels in hillsides. The soil is principally silty till consisting of unconsolidated rock fragments, pebbles, sand, and clays. The uppermost till unit is the Lavery, a very compact gray silty clay. Below the Lavery till is a more granular unit referred to as the Lacustrine unit comprised of silts, sands, and in some places, gravels which overlie a varved clay.

There are two aquifers in the site area. The upper aquifer is a transient water table aquifer in the upper 6 m (20 ft) of weathered till and alluvial gravels concentrated near the western edge of the site. High ground to the west and the Buttermilk Creek drainage to the east intersect this aquifer, precluding off-site continuity. Several shallow, isolated, water-bearing strata also occur at various other locations within the site boundary but do not appear to be continuous. The zone at which the till meets bedrock forms another aquifer that ranges in depth from 2 m (6 ft) underground on the hillsides to 170 m (560 ft) deep just east of the boundary of the facility exclusion area.

A more detailed description of the site hydrogeology is included in Section 3.1.